

REMARKS

I. Introduction

Claims 1-16 are pending in the application. In the Office Action dated March 31, 2008, the Examiner rejected claims 1-16 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,512,985 ("Whitefield") in view of U.S. Pat. No. 6,647,309 ("Bone") and U.S. Pat. No. 5,991,699 ("Kulkarni"). Applicants request reconsideration in light of the following remarks.

II. The Proposed Combinations Do Not Render the Independent Claims Unpatentable

A. Kulkarni Fails to Teach the Element for Which It Was Cited

Independent claims 1 and 10-16 each generally recite preventing values associated with at least one marked physical object from affecting ***a product quality measurement*** of a plurality of physical objects. The Examiner has acknowledged that Whitefield fails to teach the above-recited element of the independent claims and cites Kulkarni in an attempt to cure the deficiency. However, Kulkarni fails to teach the element for which it has been cited.

The invention and teaching of Kulkarni is well summarized in the SUMMARY OF THE INVENTION:

The present invention provides a system and method to ***identify defect*** groups that have a common causality during the production of semiconductor wafers and similar products. This is performed by placing selected ***defect*** data into certain meaningful clusters to approximate the actual ***defect*** groups through the use of spatial and feature data that is obtained during the inspection of the wafer at different steps in the production of that wafer. In so doing it is also more likely that the causation of the ***defect*** cluster could be determined ***thus enabling the identification of the correction actions*** that are necessary to reduce or eliminate the occurrence of further ***defects*** from the identified causation. It might even be possible to automate the corrective actions that are determined to be necessary, thus dramatically increasing the yield of a particular type of wafer that will result in reduced production costs and long term reliability of the individual components produced from the die on that wafer.

(Emphasis added.)

Thus, Kulkarni teaches to identify and cluster groups within defect data – which appears to be data on the properties of identified defects, “typically measured by inspection station 100 during inspection.” (See Col. 9, lines 54-55). By contrast, in the independent claims, “physical objects” are to be marked and prevented from affecting product quality data – which is data on the quality of the manufacturing process, and not on the specific properties of the defects.

Further, Kulkarni teaches clustering of defect groups to enable identification of corrective actions. Kulkarni is primarily concerned with identification of such corrective actions, and is not per se concerned with product quality measurement. Indeed, the terms “quality” or “quality measurement” are never mentioned in Kulkarni. By contrast, the independent claims are concerned with preventing data from marked objects from affecting a product quality measurement.

The section of Kulkarni that is cited in the Office Action (col. 9, line 65 – col. 10, line 7 and col. 10, lines 12-33) is concerned with removing the defect data (i.e. “the defect properties” measured by the defect station 100 - see col. 9, lines 54-55) information on defects for which the causes are known, reducing the defect data to “unidentified” data, and representing “random defects not attributable to determinable specific causes and individual defects for later identification.” (See Col. 10, lines 6-7). This does not prevent “values associated with the at least one marked physical object from affecting a product quality measurement,” as recited in the independent claims. Instead, it prevents reconsideration of defect data for which the cause of the defects is known – a different problems and a different solution from those described and claimed in the present application.

It is therefore believed that Kulkarni does not disclose or suggest the feature for which it was applied in the rejection, and therefore cannot be used to modify Whitefield, as argued in the Office Action, to teach “[p]reventing values associated with the at least one marked physical object [that does not satisfy a prescribed selection criterion] from affecting a product quality measurement of a plurality of physical objects,” especially since neither Whitefield nor Kulkarni are concerned with product quality measurement. For at least this reason, the proposed combinations of Whitefield, Bone, and Kulkarni do

not render independent claims 1 and 10-16, or any claim that depends on claim 1, unpatentable.

B. The Proposed Combination Is Improper

Further, Applicant notes that there no apparent reason (aside from hindsight) to combine Whitefield, Bone, and Kulkarni as proposed by the Examiner to arrive at the claimed invention. One inventive concept of the present invention is to combine two conceptually different quality control management tools: the so-called SPC method, measuring the average quality of the objects (using a random sample) with the so-called FDC method, segregating objects of a low quality (by measuring every object). Another inventive concept is to perform the FDC method before the SPC method, i.e. the objects of a low quality are segregated before the average quality of the objects is measured, ensuring thereby that a non-representative object cannot serve as a random sample for a SPC measurement.

According to the Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___ (2007), “inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.” *Id.* at 15. Consequently, the Court held that it “can be important to **identify a reason** that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed (emphasis added). *Id.* at 15.

The Court specifically stated that for an obviousness inquiry it may be necessary to look to:

. . . interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge processed by a person having ordinary skill in the art, all in order to determine whether there was an **apparent reason** to combine the known elements in the fashion claimed

Id. at 14. (Emphasis added.)

No sufficient “apparent reason,” either based on interrelated teachings, effects of demands, or background knowledge, has been given in the Office Action or is believed to exist that would have prompted a person of ordinary skill in the relevant field to combine Whitefield with Bone and Kulkarni to arrive at the claimed invention. The arguments given in the Office Action for combining Whitefield and Bone are minimal,

and appear to be little more than an assertion that such a combination would be “obvious and well known in the prior art for reasons of cost, sterility, and reliability,” without addressing the specific teachings of either cited reference or why their particular teachings would be combined. Similarly, the stated reasons for combining Whitefield with Kulkarni appear to be general, and do not discuss any specific basis – interrelated teachings, effects of demands, or background knowledge – for making such a combination. Without some reasoned, specific basis for making these particular combinations, the combinations appear to be little more than a hindsight reconstruction of the claimed invention from disparate elements selected in a pick and mix fashion from the cited art. Applications further note that the Office Action contains only arguments to modify Whitefield with Bone and to modify Whitefield with Kulkarni – it is silent regarding any apparent reasons for modifying Whitefield with Bone AND Kulkarni.

Further, at least with respect to the stated reasons to combine Whitefield with Kulkarni, the Office Action appears to misidentify the teachings of Kulkarni by stating that it would be obvious to “modify the method of Whitefield by excluding data from ‘bad’ components or regions at taught by Kulkarni.” However, as is discussed above, Kulkarni is concerned with determining the cause of defects by removing from defect data, clusters of data for which a cause is known. It is unclear what data this would suggest removing in Whitefield. Whitefield appears to be directed to “automating, broadening and standardizing the criteria base by which wafer pass and fail decisions, specification limit change decisions, and process control change decisions are made.” (Whitefield, col. 2, lines 50-54). It does not suggest a need for clustering defect data to determine the cause of defects, as taught by Kulkarni.

There is no apparent reason with a reasonable expectation of success for modifying or combining Whitefield, Bone, and Kulkarni as proposed by the Examiner. For this additional reason, the proposed combinations of Whitefield, Bone, and Kulkarni do not render independent claims 1 and 10-16, or any claim that depends on claim 1, unpatentable.

III. Conclusion

In view of the foregoing remarks, Applicant submits that the pending claims are in condition for allowance. Reconsideration is therefore respectfully requested. If there are any questions concerning this Response, the Examiner is asked to phone the undersigned attorney at (312) 321-4200.

Respectfully submitted,



Scott W. Brim
Registration No. 51,500
Attorney for Applicants

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200